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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/471,460 12/22/99 FIGURA

T 94-0280.03

EXAMINER

MM91/0606

LEE, C

ART UNIT

PAPER NUMBER

2825

DATE MAILED:

06/06/00

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.

09/471,460

Applicant(s)

Figura et al.

Examiner

Calvin Lee

Group Art Unit

2825



☐ Responsive to communication(s) filed on \_\_\_\_\_

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claim

☒ Claim(s) 1-46 is/are pending in the applicat

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-46 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☒ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☐ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 5 and 6

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

## DETAILED ACTION

### *Claim Rejections - 35 U.S.C. § 101*

1. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

2. A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer **cannot** overcome a double patenting rejection based upon 35 U.S.C. 101.

3. Claims 1-8, 10-14, 19-24, 29-32, 36-39 and 40-44 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-8, 10-14, 19-24, 29-32, 36-39 and 42-46 of copending Application No. 09/470,651. This is a **provisional** double patenting rejection since the conflicting claims have not in fact been patented.

### *Claim Rejections - 35 U.S.C. § 112*

4. Claims 1, 4-7, 13, 23, 25-27, 29-30, 33-34 and 39-40 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The specification does not disclose any of the following phrases, such as: *a second feature on said surface, a polymer between said first feature and said second feature, a first metallic feature, a second metallic feature, a first metal line, a second metal line, a second protruding*

*feature on said layer, exposed metal protruding features, exposed metal lines, providing a layer over said polymer.* Instead, the specification clearly discloses a method of forming a conductive layer, such as a polysilicon layer, formed within a recess embedded in an insulator and connected an underlying substrate through a contact located at the bottom of the recess.

5. Claim 42 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The specification discloses that a layer of etch resistant material, such as a polymer, is formed in a recess (page 5); the process has a plurality of process settings (page 6). However, this disclosure is not sufficiently enabling to teach the conditions required to selectively form a polymer in a recess. Further, the specification is not enabling to teach how to form a material selectively in a recess where a first material has been deposited in the recess and over a surface prior to the selective deposition step.

The use of "*having a polymer with a thermal stability sufficient to withstand providing said layer*" (at claim 42, lines 2-3) renders the claim vague and indefinite as the metes and bounds of the claim can not be ascertained. Changing to a proper language is suggested.

#### ***Claim Rejections - 35 U.S.C. § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Fujita et al.* (U.S. Patent No. 5,084,413) in view of *Numata et al.* (U.S. Patent No. 4,759,958), and further in view of *IBM* (IBM Technical Disclosure Bulletin, Vol. 25, No. 9); *Donohoe et al.* (U.S. Patent No. 5,904,799) and *Wang et al.* (U.S. Patent No. 5,354,715).

a) In re claims 1-7, 13, 19, 25, 27, 30-32, 35-43 and 46, *Fujita* teaches a method of forming a semiconductor device, comprising the steps of: forming a recess 16 embedded inside an oxide layer 14 having a contact 12 in connecting to the underlying substrate (see Fig. 1); depositing a conductive film 18, such as a film containing metal, over the whole structure (see Fig. 3 and col. 3, lines 3-19); filling the recess with a polyamide 22 as a resist layer which is removed by the etching method to expose the substrate surface surrounding the recess (see col. 3, lines 20-39); etching a portion 22A of the resist layer to expose conductive film 18 which has been left on the sidewall and the bottom of the recess (see Fig. 7 and col. 3, lines 40-43).

However, *Fujita* does not teach how to form the polyimide layer. The *Numata* reference teaches a method of forming CVD polyimide for use with semiconductor elements (see col. 1, lines 7-12), which has a high strength and eliminate the necessity of precise evaporation control (see col. 1, line 63 through col. 2, line 2).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have formed the polyimide by CVD in the process of *Fujita* for the benefits taught by *Numata*.

The combination reference of *Fujita* and *Numata* teaches forming the polyimide layer but not the polymer layer. The *IBM Disclosure* teaches a method of forming TEFLON polymer layer for use with semiconductor elements (see col. 1, lines 7-12).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have formed the resist material in the process of *Fujita* of plasma-deposited TEFLON polymer for the benefits of having a high strength and eliminating the necessity of precise evaporation control.

b) In re claims 8-12, 14-18, 20-24, 26, 28-29 and 33-34, the combination reference of *Fujita*, *Numata* and *IBM* does not teach a plurality of process settings occurred in the chamber.

*Donohoe* teaches a conventional high-density plasma reactor, using plasmas comprised of fluorine-containing gases in high-density for etching materials used in VLSI fabrication (see Fig. 2 and col. 1, lines 37-67) and discloses a plurality of process settings, such as: a source power of 3000 watts, a bias power of 31 to 95 watts, etc.(see col. 5, lines 40-67).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the process of *Fujita* by utilizing the *Donohoe*'s reactor and its process settings which are conventionally appropriate for polymer because one would adjust settings to result in the most effective etching process.

c) In re claims 44-45, the combination reference of the *Fujita*, *Numata*, *IBM* and *Donohoe* does not teach the dry etching step and the polymer formation performing in a same chamber.

*Wang* teaches a motivation generally to deposit and etchback where the CVD deposition and plasma etchback happen simultaneously in the same chamber (see col. 20, lines 21-33).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have performed the deposition and plasma etchback of the polymer in the same chamber for the benefits of reducing process time and contamination taught by Wang.

***Contact Information***

Any inquiry concerning this communication from the examiner should be directed to Examiner Calvin Lee at (703) 306-5854. The examiner can normally be reached on Monday through Thursday from 7:00AM to 4:30PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor *Matthew Smith* can be reached on (703) 308-1323.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956 or (703) 306-3329. The fax phone number for the Group is (703) 308-7722.

CL

May 30, 2000



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